

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Please cancel claim 56 without prejudice; and amend claims 45, 55, 60-61, 63-68 and 70-71 as follows. The remaining pending claims are unamended.

1-44. (Canceled)

45. (Currently amended) A device for analyzing a sample, the device comprising:

- a) a body having:
 - i) a reaction chamber for conducting a reaction;
 - ii) a separation channel for separating sample components [of the sample];
 - iii) a transition region connecting the reaction chamber to the separation channel, wherein the portion of the body defining the transition region has sufficiently low thermal conduction so that the transition region substantially thermally isolates the reaction chamber from the separation channel; and
 - iv) at least one valve in the transition region for controlling fluid flow between the reaction chamber and the separation channel; and
- b) at least two electrodes coupled to the body, the electrodes being positioned to induce electrophoretic flow, electroosmotic flow, or isoelectric focusing of the sample components [to separate into bands] in the separation channel when a voltage difference is applied between the electrodes.

46. (Previously added) In combination with the device of claim 45, an instrument into which the device may be inserted, the instrument having electrical connections for applying the voltage difference between the electrodes and having at least one light source and detector for detecting the sample components in the separation channel.

47. (Previously added) The combination of claim 46, wherein the instrument further includes a heater for heating the reaction chamber.

48. (Previously added) The combination of claim 46, wherein the instrument includes additional optics for monitoring the reaction chamber.
49. (Previously added) The device of claim 45, wherein the body further includes:
 - a) a side channel connected to the transition region for adding or removing fluid from the transition region; and
 - b) at least a second valve for controlling fluid flow through the side channel.
50. (Previously added) In combination with the device of claim 49, an instrument into which the device may be inserted, wherein the valves comprise membrane valves, the instrument has electrical connections for applying the voltage difference between the electrodes, and the instrument further has means for controlling the membrane valves.
51. (Previously added) The combination of claim 50, wherein the instrument pneumatically controls the membrane valves.
52. (Previously added) The device of claim 45, wherein the valve comprises a mechanical valve having an open position and a closed position.
53. (Previously added) The device of claim 45, wherein the body further includes an inlet port for adding the sample and reagents to the reaction chamber.
54. (Previously added) The device of claim 45, wherein the body comprises a one-piece polymeric body having the reaction chamber, transition region, and separation channel formed therein.
55. (Currently amended) The device of claim 45, wherein the separation channel comprises an electrophoresis or [IEF] isoelectric focusing channel containing separation material.
56. (Canceled)

57. (Previously added) The device of claim 45, wherein each of the electrodes is embedded in the body such that one end of the electrode protrudes through an external surface of the body and such that the other end of the electrode protrudes into an internal region of the body.
58. (Previously added) The device of claim 45, wherein the body comprises a polymeric material, and wherein the electrodes are over-molded in the body.
59. (Previously added) The device of claim 45, wherein the electrodes are screen-printed on the body.
60. (Currently amended) A method for analyzing a sample, the method comprising the steps of:
 - a) introducing the sample into a device having:
 - i) a reaction chamber;
 - ii) a separation [channel] region;
 - iii) a transition region connecting the reaction chamber to the separation [channel] region, wherein the transition region has sufficiently low thermal conduction so that the transition region substantially thermally isolates the reaction chamber from the separation [channel] region; and
 - iv) at least one valve in the transition region;
 - b) subjecting the sample [components] to a reaction in the reaction chamber while the valve is closed, wherein the transition region substantially thermally isolates the reaction chamber from the separation [channel] region during the reaction;
 - c) opening the valve;
 - d) injecting into the separation [channel] region a sample plug containing reaction products;

- e) separating the reaction products [into bands] in the separation [channel] region; and
- f) detecting the separated reaction products [bands].

61. (Currently amended) The method of claim 60, further comprising the steps of:

- i) optically monitoring the reaction products contained in the reaction chamber; and
- ii) determining if sufficient reaction products have been generated within the reaction chamber prior to injecting the sample plug into the separation [channel] region.

62. (Previously added) The method of claim 60, wherein the reaction comprises a nucleic acid amplification reaction, and wherein the reaction products comprise amplified nucleic acid.

63. (Currently amended) The method of claim 60, wherein the plug is injected into the separation [channel] region by electrophoretic injection.

64. (Currently amended) The method of claim 60, wherein:

- i) the device includes a body defining the reaction chamber, separation [channel] region, and transition region, and wherein the separation region comprises a separation channel;
- ii) the device further includes at least two electrodes coupled to the body, the electrodes being positioned to induce electrophoretic flow, electroosmotic flow, or isoelectric focusing of the reaction products in the separation channel when a voltage difference is applied between the electrodes;
- iii) the method further comprises the step of inserting the device into an instrument having electrical connections for applying the voltage difference between the electrodes and having at least one light source and detector for detecting the reaction products in the separation channel; and

- iv) the steps of separating and detecting the reaction products [into bands and detecting the bands comprises] comprise applying the voltage difference through the electrical connections in the instrument and detecting the [bands] reaction products using the at least one light source and detector.

65. (Currently amended) The method of claim 64, wherein the instrument further includes a heater for heating the reaction chamber, and wherein the step of subjecting the sample [components] to the reaction comprises heating the reaction chamber with the heater.

66. (Currently amended) The method of claim 60, wherein:

- i) the device further includes a side channel connected to the transition region; and
- ii) the method further comprises the step of adding fluid to or removing fluid from the transition region through the side channel prior to, during, or after the step of injecting the sample plug into the separation [channel] region.

67. (Currently amended) The method of claim 60, wherein:

- i) the device further includes a side channel connected to the transition region; and
- ii) the method further comprises the steps of adding reagents to the transition region through the side channel and mixing the reaction products with the reagents in the transition region prior to the step of injecting the sample plug into the separation [channel] region.

68. (Currently amended) The method of claim 60, wherein:

- i) the device further includes a side channel connected to the transition region; and
- ii) the method further comprises the steps of adding buffer solution to the transition region through the side channel and injecting the buffer solution into the separation [channel] region prior to the step of injecting the sample plug into the separation [channel] region.

69. (Previously added) The method of claim 66, wherein the device further includes at least a second valve for controlling fluid flow through the side channel, and wherein the method further comprises the step of opening and closing the second valve to control fluid flow through the side channel.
70. (Currently amended) The method of claim 60, wherein the reaction products are separated [into bands] by electrophoresis.
71. (Currently amended) The method of claim 60, wherein the reaction products are separated [into bands] by [IEF] isoelectric focusing.